Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division

comments on

Sampling and Analysis Plan
to Support the Source Removal at the Trench T-1 Site (IHSS 108)
February 17, 1998
Revision Draft C

1. Some elements required or recommended in regulatory guidance and examples of Quality Assurance Project Plans and Sampling and Analysis Plans are inadequately addressed in this document. Examples include information on detection limits, instrument calibration, details on analytical methods, QA/QC requirements and contingency plans to be used in case unexpected problems are encountered. Some of these issues may not be resolved until an analytical contractor is selected, but approval of this document can only be partial, contingent on reviewing those additional details. The SOW for the analytical contract may provide sufficient detail if it can be released to the regulatory agencies.

2. Page 3, paragraph 3: Uranium "indicative of enrichment" was not mentioned in the PAM. Significant amounts of enriched uranium could have an enormous impact on NESHAPs, and perhaps on worker Health and Safety Plans.

3. Page 6, paragraph 1: Clarify whether this gamma spectroscopy refers to *in situ* spectrometry or work done in a laboratory. While ^{241}Am, ^{235}U and ^{238}U are detectable in large amounts by gamma spectrometry, quantification is difficult because of the low energies and emission rates, interference by naturally occurring radionuclides in soil, geometric considerations and high uncertainty. If these issues cannot be satisfactorily resolved, analysis by alpha spectrometry would be preferable. Soils returned to the trench should be verified by alpha spectrometry in any case.

4. Pages 7-8: For floor and sidewall sampling, analysis by gamma spectrometry may result in unacceptably high uncertainties as mentioned in comment #2. Identify what analysis will be performed if this is the case.

5. Pages 12-13: FIDLER measurements are unreliable, subject to high uncertainties and inappropriate for comparison to RFCA action levels. Gamma spectrometry *may* be appropriate, but approval of that method should await review of analytical and QA/QC procedures. Verification by alpha spectrometry should be performed on some, if not all, soils returned to the trench.

1
2

6. Page 25, Samples for non-volatile analysis, bullet 3; Page 30, bullet 2: Homogenization of soils for any radionuclide analysis will require much more than "turning over the bag...between 30 seconds and one minute." Such homogenization is usually done mechanically, for several hours, to ensure accurate results.

7. Page 29; 3.2.1, paragraph 3: The PAM refers to "three times background", but does not mention FIDLER surveys. Background, and activity in soils, should be determined isotopically.

8. Page 38-39; 5.3 Quality Assurance: This section mentions PARCC parameters, but only briefly discusses two. The referenced Administrative Procedure may contained sufficient detail but has not been available to the regulatory agencies. A summary of how each of the PARCC parameters will be used to evaluate the analytical data should be included and a copy of the referenced document provided to the agencies.

9. Appendix I, Plutonium to Americium Ratios...: The methods for making these calculations are correct, but use of the ratio for decision making requires two assumptions. First, that there has been no chemical separation of Am and Pu in the time since these materials were placed in the trench, and second, that there was no Am in the materials at the time they were placed there. The second can be ignored since any additional Am would result in an overestimate of the ^{239}Pu activity. The first is more serious, since any movement of Am away from the Pu would result in an underestimate of the Pu activity, and could result in Tier 1 action levels being unknowingly exceeded. While the form and condition of any plutonium in the trench is unknown, the chemical behavior of Am is different from that of Pu, and measurements of both nuclides by alpha spectrometry in buffer zone soils show large variations in the Pu/Am ratio, implying that given enough time these nuclides will separate. A suggested resolution is to establish a project-specific ratio using the 95% UCL as is currently being done for the 603 Pad characterization project.

10. During this project, the agencies may request split samples to be analyzed at a CDPHE and/or EPA lab.

Post-it® Fax Note 7671	Date	# of pages ▶ 1
To Hopi Solomon	From Norma Castañeda	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 4046	Fax #	

2/2